

MICROSCOPE USING DIFFRACTION OPTICAL DEVICE

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Abstract

PURPOSE To obtain an apodization effect and a super-resolution effect without using multilayer film by arranging a diffraction optical device in which different diffraction effects can be displayed at different parts in a pupil.

CONSTRUCTION: This microscope is constituted of a ring slit 1 arranged at the pupil position of a condenser, the condenser 2, a sample 3, an objective lens 4, a spatial frequency filter 5 arranged at the pupil position on the objective lens 4 side, and an image surface 6. The spatial frequency filter 5 is a concentric rectangular phase grating, and whose duty factor at the conjugate part of the aperture part 1a of a cyclical slit 1 arranged at the pupil position of the condenser 2 is set at 0.5, and the duty factor at another part is set as 0.1. Also, the depth of the grid is adjusted so as to be $\phi n = \pi/6$ at certain wavelength, and the diffraction effect of 0th-order light at respective part is set so as to be 50% and 82%. At this time, the pitch T of a diffraction grating is set so that diffracted light other than diffracted 0th-order diffracted light can go to the one not being made incident on an optical system behind the pupil of the microscope.

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